# Book Review

## Catalysis by Gold
## Geoffrey C Bond, Catherine Louis, David T Thompson
## Imperial College Press
## ISBN: 1-86094-658-5

Graham G Hutchings has recently presented *"Catalysis by Gold"* as the sixth volume of the Catalytic Science Series by Imperial College Press which follows the previous *"Environmental Catalysis", "Catalysis by Ceria and Related Materials", "Zeolites for Clean Technologies", "Isotopes in Heterogeneous Catalysis"* and *"Supported Metals in Catalysis".*

The Authors, Geoffrey C Bond, Catherine Louis and David T Thompson, well known to the community involved in catalytic studies, introduce the reader into one of the most exciting pages of the current academic and industrial research which has been thrilling us for the last fifteen years. In particular, this book documents the rapid evolution of gold chemistry, reviewing fundamental studies since the pioneering papers of Haruta, Hutchings and Galvagno-Parravano. After considering that the surprising progress of gold chemistry has been due to synergetic effects between nanoscience and catalysis, we will discover how, from the inert yellow metal, small particles can be prepared, characterised and applied as catalysts for chemical processing, environmental control and electrochemical technologies.

The text contains two introductive chapters recalling the basic concepts of catalysis and the general properties of gold, which are followed by three fundamental chapters, the first dedicated to the preparation and properties of small gold particles, the second giving a wide description of the methods for preparing and characterising supported gold catalysts and the third one dealing with the chemisorption of simple molecules on gold.

The catalytic applications are discussed in ten chapters dedicated to different topics as oxidation of carbon monoxide, selective oxidation of carbon monoxide in hydrogen, selective oxidation of organic molecules, reactions involving hydrogen, the water-gas shift, reactions of environmental importance, homogeneous catalysis and supported catalysts, miscellaneous reactions and commercial applications.

Owing to its practical importance and for historical reasons, the low temperature oxidation of CO represents the most widely discussed argument. Two distinct dedicated chapters highlight the importance of this research area. The first one has the merit to point out agreements and disagreements and to summarise the present position of the research on CO oxidation, which opened the new age of gold chemistry and still represents one of the most investigated field of catalytic applications. The second part is dedicated to the removal of trace amounts of CO for preparing pure $H_2$ for use in fuel cells.

Introduction, presentation and conclusions in each chapter, along with frequent recalls of basic concepts, allow a facile comprehension of the matter. Quite helpful is the appendix "introduction to density functional theory" by Eric L Short, which presents the Car and Parriello's quantum mechanical approach to chemisorption modelling to a large audience. Through accurate literature data and critical comments, the book offers a detailed map of the research groups worldwide involved in catalytic applications of gold.

*Catalysis by Gold* is a book of great cultural relevance combined with a simple and pleasant reading. Certainly, it is an appropriate time in the remarkable progress of gold catalysis for the first comprehensive review of the subject. This excellent book should be essential reading for all those working in gold catalysis or seeking to exploit it – research students, industrialists, etc – as well as for those working generally in the catalysis field.

Michele Rossi
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*Editor's note:* This book contains 350 pages and costs US$88/£51. Details were published in the last issue or from: www.icpress.co.uk/chemistry/p450.html